dog, weasel, ferret, and coati, at the juncture of the middle and anterior third ; in the badger, polar bear, and ratel it was further back, just in front of a line dividing the dorsum of the hemispheres into an anterior and posterior half. In comparing the cerebrum of the Carnivora and Pinnipedia with that of man and apes, Turner finds a morphological correspondence between certain of the convolutions and fissures. In the walrus and seals the Island of Reil, he says, may find its representative in the anterior limb of the Sylvian convolution, which is more or less hidden within the fissure of Sylvius. If this indication be true, he believes that the Island of Reil, which in the brain of the ape, and more so in man, is entirely concealed within the Sylvian fissure, is either the homologue of the Sylvian convolution of the carnivorous brain, or that the Sylvian convolution in the Carnivora potentially represents both that convolution and a rudimentary insula. He thinks there can be no doubt that the anterior and upper part of the splenial fissure in the brain of the Carnivora and Pinnipedia corresponds with the fissure which is known as calloso-marginal in man and apes. In several of the Canidae the splenial fissure was continuous with the crucial fissure, but in the cat, tiger, coati, and polar bear they were not continuous ; whilst in *Phoca vitulina* the two fissures were continuous in one hemisphere, but not in the other. From the anatomical data and experimental evidence Turner thinks it may be assumed that the fissure of Rolando is homologous with the coronal fissure in the carnivorous brain. He says in conclusion : "From the point of view of the hypothesis of evolution there would be no reason to think that the smooth-brained lower apes had originated out of the Carnivora, at least after the cortex of the cerebrum in this latter order had begun to assume a convoluted arrangement. If they had been derived from a carnivorous animal with a convoluted brain, then in all likelihood the convoluted character of the cerebrum would not have disappeared in the process of evolution. If the higher apes have been derived by descent from the lower apes, then the hemispheres in the former, with their complex arrangement of fissures and convolutions, have been evolved from a smooth-brained stock, and not from an animal with such an elaborate arrangement of convolutions as is possessed by either a dog or a seal. Hence, the acceptance of this hypothesis is not inconsistent with the fact that the convolutions of the brain in the apes assume from the first their own methods of arrangement, and not necessarily that of the orders of mammals with convoluted brains which are lower in the series. Beyond, therefore, a certain general correspondence in the arrangement of those fundamental parts of the cortex which serve a similar purpose in these various orders, one does not find it possible to determine the presence of convolutions arranged in a precisely corresponding manner in the brains of the Carnivora and Pinnipedia on the one hand, and of man and apes on the other." F. T.

*The Morphology of the Vagus Nerve.* THOMAS W. SHORE. Jour. of Anat. and Phys. Vol. XXII, 1888, pp. 372–390.

After giving the anatomy and development of the vagus nerve in Petromyzon, Elasmobranchs, the frog, Amniota, and the chick, and after some discussion of the morphological value of its various portions in these types, the author concludes that there is evidence to show, first, "that the vagus is a 'compound nerve,' but not in the

sense generally supposed; it is rather a compound of the visceral rami of the anterior spinal nerves, and of the remnants of the brain-ganglia and lateral cords of the nervous system of invertebrata, than of several metameric nerves." Secondly, "that the visceral part of the vagus of fishes includes the branchial nerves, and has arisen from a coalescence of the visceral rami of the anterior spinal nerve segments, the corresponding motor and sensory somatic branches of which have remained separate." Thirdly, "that the ganglia of the cranial nerves (5th, 7th, 9th and 10th) are the representatives of the brain lobes of Nemertea, and probably of the cerebral ganglia of Annelida and Arthropoda." Fourthly, "that the ramus lateralis is of extreme ancestral origin, and is equivalent to the lateral strands in the nerve plexus of Nemertea, to the main nervous system of Annelida and Arthropoda, and possibly also to the nerve ring of Coelenterata." Fifthly, "that a study of the vagus nerve throws light on the question of the chordate ancestor, and does not tend to support the views of Dohrn and his school." Sixthly, "that the value of the vagus in deciding the question of the segmentation of the vertebrate head has been much overrated."

F. T.

A Rudimentary Sense Organ.

(1). *Zur Deutung und Entwickelung des Gehirns der Knochenfische.* Rabl-Rückhard. Archiv. f. Anat. u. Physiol. (Anat. Abth.) 1882.
(2). *Untersuchung über das Gehirn der Petromyzonten.* F. Ahlborn. Zeit. f. wiss. Zool. Bd. XXXIX, 1883.
(3). *Ueber die Bedeutung der Zirbeldrüse.* F. Ahlborn. Ibid. Bd. XL, 1884.
(4). *Zur Anatomie u. Entwickelung der Epiphyses bei Amphibien und Reptilien.* H. W. De Graaf. Zool. Anz., March, 1886.
(5). *On the Presence and Structure of the Pineal Eye in Lacertilia.* W. B. Spencer. Quart. Jour. Micr. Sci., October, 1886.
(6). *The Parietal Eye of the Cyclostome Fishes.* J. Beard. Ibid. July, 1888.
(7). *The Pineal Eye in Extinct Vertebrates.* E. D. Cope. Am. Naturalist, October, 1888.
(8). *Recherches sur le développement de l'epiphyse.* P. Franchotte. Archiv de Biologie, Tome VIII, 1888.

Amongst human anatomists there has existed much doubt and consequent diversity of opinion concerning the function of the pineal gland or epiphysis of the brain.

Recently—within the last three years—we have advanced far towards a solution of the problem, by a comparative study of this so-called gland in the different classes of vertebrates.

In 1882 Rabl-Rückhard (1) was the first to throw some light upon the function of the gland. He suggested, from his study of its development in the trout, that the pineal body might represent an eye and was comparable to the paired lateral eyes, but failed to give properly the anatomical structure of this median eye.

Ahlborn (2 and 3) carefully described its structure in the fish Petromyzon in 1883; and in 1884, discussing the nature of the pineal gland, says he comes to the conclusion that it may be regarded as the rudiment of an unpaired eye, and to be compared perhaps to the median eye of the lancelet and of the tunicates.